

# *Interaktion*

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I U G N - 9

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## Editorial

Dear Member,

Radio Amateurs may like to contact RAMTOP at, The School, Wellingborough, Northants, NN8 2BX. (Enclose S.A.E.). This is a radio computing user group with a monthly newsletter containing such items as RTTY and morse input programs. It is non-profit making designed only to serve the radio/computer enthusiast.

"VAPOURWARE", a new buzzword which is defined as hardware announced but never released. (Such as the Z800 chip!).

It's October and subscriptions are due, unless you are a direct debit subscriber. Payment for 1986 should be made before January so's we can adjust our mail shot for the coming year. Please send subscriptions to Pete Vella at the USER GROUP contact address. £7.00p should be enough.

Have you ever wondered why they have computers in schools? I think it enhances the teachers pay packet whilst allowing them to sit back and let the children play with a pseudo-technical keep-em-quiet subject. If computers were to be taught properly the children would need to learn binary arithmetic, coding, digital electronics and machine principles to mention but a few items. This of course would require actual teaching effort and knowledge (which few teachers possess) and so would never do.

If you think that I am being harsh just consider how long it takes to construct a program in BASIC and then give yourself the restriction of a limited knowledge of algebra and a shared computer for short periods of time. Worse still, two or three children writing a program together. If it wasn't so sad it would make me laugh. Teach them maths, physics, english etc. Computers they will then learn in a few weeks if they are interested.

Almost all of my contact with computers shows me that the subject is the application of mixed knowledge gained from the more fundamental subjects, computer science is a derived subject much as gardening is really aspects of biology, physical exercise and Latin.

COMPUTER SUBJECT	REAL SUBJECT
Binary arithmetic	Maths
Digital electronics	Physics
Languages	English lang, Philosophy
Concepts	History, Philosophy
Logical thought	Maths, Religion, English Lit.

The only use for computers in schools is in the science lab alongside the scope and test tubes, as data recorders, in the study of the real world.

I want my children to learn the basics of the worldwide knowledge base, not to fool around with an application subject, especially one that will be outdated faster than they can learn it. This is particularly true given the superficial level of keyboard to screen play-teach that is offered in today's schools.

Bob Eldridge.

## ALIEN OOGE

BY MEL SAUNERS

For XTAL BASIC with a 32 column 24 line screen

A dodge the aliens game

```
10 REM ****
20 REM *DO YOU HAVE A PSG OR A PCG CARO, THIS PROGRAMME *
40 REM *WILL MAKE USE OF BOTH *
50 REM ****
100 POKE&F800,56,56,16,254,186,186,56,40,40,108
110 POKE&F830,84,I49,75,82,58,181,90,60,155,60
120 CLS
130 PRINT: INPUT"ENTER NAME PLEASE ";N$:PRINT
140 PRINT
141 PRINT" DO YOU NEED INSTRUCTIONS ";:I=INCH:IF I=89 THEN GOSUB 670
160 PRINT:PRINT
170 PRINT:PRINT" WHAT IS YOUR SPEED(0-9) ";:K=INCH-48
180 IF K<0 OR K>9 THEN 170
185 K=K*5
190 CLS
200 FOR ALIEN=1 TO 100
210 P=&F000+INT(RND(768))
220 POKEP,&1C
230 NEXT ALIEN
240 POKE&F2F0,&1E,&1F
250 REM: START POINT.RUN COUNT
260 R=&F002:J=I
270 REM: NO PCG POKE'R' WITH &10
280 POKER,&80:POKER+32,&20
290 FORT=1 TO 500:NEXT T
300 PRE=R
310 M=KBD
320 IF M=&50 THEN R=R+I:GOTO 350
330 IF M=&51 THEN R=R-1:GOTO 350
340 R=R+32
350 IF PEEK(R)=&1C THEN 430
360 IF PEEK(R)=&1E OR PEEK(R)=&1F THEN 500
365 REM: NO PCG POKE'R' WITH &10
370 POKEPRE,32:POKER,&80
380 REM: CONVERT SPEED INPUT
390 S=K/K/K*1000:FORT=1 TO S:NEXT Y
400 IF R>&F2FF THEN POKER,&20:GOTO 620
410 GOTO 300
420 REM: CRASH ROUTINE
425 REM: NO PCG POKE'R' WITH &1A
430 POKEPRE,&20:POKER,&83
440 GOSUB 850
450 FORT=1 TO 500:NEXT T:CLS
460 PRINT@3,3,"you have just had a nasty...ACCIDENT!!"
470 PRINT" When you recover would you like...?"
480 GOTO 570
490 REM: WIN ROUTINE
500 POKEPRE,&20
510 GOSUB 8910
520 FOR Q=0 TO 13:OUT&C0,Q:OUT&C1,0:NEXT Q:CLS
530 PRINT:PRINT" WELL DONE "N$" YOU MADE IT JUST IN TIME TO ESCAPE"
```

```

540 PRINT:PRINT" IT TOOK YOU"J"RUNS "
550 PRINT" AT A SPEED OF";K
560 PRINT:PRINT" YOUR ASTRO RATING £";K*K/.35:PRINT
570 PRINT" ANOTHER GAME ? ";A=INCH:IF A=89 THEN 170
590 CLS
591 PRINT
592 PRINT@0,12,"GOODBYE "N$" COME AND PLAY AGAIN SOMETIME 'STINKER'"
600 END
610 REM:NEW RUN
620 R=R-768:J=J+1
630 IF PEEK(R)=&1C THEN POKER,&20
640 GOTO370
650 REM:INSTRUCTIONS
660 DIM H$(6)
670 CLS: H$(1)=".....ALIEN DOODE....."
680 H$(2)="*****"
690 H$(3)=" you are at the top left of your scanner'your mission is
to get to your base"
700 H$(4)=" this you will find at the bottom right of the scanner!"
710 H$(5)=" USE THE 'Q'KEY TO TAKE YOU TO
THE LEFT AND THE 'P'KEY WILL MOVE YOU TO THE RIGHT"
720 H$(6)="you will be blown to bits if...
you hit an alien, BUT just may survive for another RUN!"
730 H$(7)="~~~~ THE GAME WILL START ON ~~~~ ~~~~~~"
ZERO COUNT ~~~~~~"
740 FORI=1TO7:PRINT
750 FOR J=1TOLEN(H$(I))
760 PRINT MID$(H$(I),J,1);
770 FORT=1TO75:NEXTT:NEXTJ:PRINT:NEXTI
775 IOM4,1:IOM5,1
780 FORT=100TO0 STEP-1
790 FORQ=1TO100:NEXTQ
800 PRINT@6,23,T,:PRINT@10,23,"AND COUNTING";
810 NEXTT
815 IOM4,0:IOM5,0
820 CLS
830 RETURN
840 REM:EXPLOSION SOUND
850 RESTORE 880:FORT=0TO13:READA
860 OUT&C0,T:OUT&C1,A
870 NEXTT
880 DATA0,0,0,0,0,0,31,7,16,16,16,0,120,0,
890 RETURN
900 REM:TAKE-OFF SOUND
910 RESTORE 930:FORA=0TO13:READZ:OUT&C0,A:OUT&C1,Z:NEXTA
920 RESTORE 930
930 DATA100,0,0,0,0,0,0,26,20,0,0,0,20,12
940 REM:TAKE-OFF DISPLAY
950 FORV=&F2FE TO &F000 STEP-33:POKEV-1,&20,&20:POKEV,&1E,&1F:
FORQ=1TOK/K/K*100:NEXTQ:POKEV,&20,&20:NEXTV
960 RETURN
970 REM
980 REM ****
990 REM * COPYRIGHT OF MEL SAUNOERS 2/84 *
1010 REM ****

```

**A FLOPPY DISK INTERFACE**  
BY SIMON WALLER

I soon found that using a tape recorder to store programs can be slow and limiting. I purchased two 8 inch Shugart SA801 single sided disk drives from a friend who already has a computer running CP/M, the goal for which I now aimed.

I chose the WD2729 interface chip as it offered simplicity of design with the ability to expand to double sided drives if I ever wanted to. The data sheet on the chip shows how to do the basic connections and to set it up. Only the interface bus was left to design.

The main problem was arranging a configuration which would allow the software to read and write in double density. The worst case service time for writing in double density (the time from when the 2797 asks for more data to when it must be supplied) is 11.5 microseconds. A simple loop checking for end of command condition or data request can not do this fast enough, even when running at 4Mhz.

The 2729 has two outputs for data request (DRQ) and interrupt request (INTRQ), which is asserted at the end of a command. They are copies of the two least significant bits in the status register. As can be seen from the circuit diagram, these two lines can be read from the bus with the other six bits presettable.

For example, suppose that these six bits are preset to read 0011xx11. The four possible states of DRQ and INTRQ are :-

DRQ	INTRQ	Value	Meaning
0	0	33H	End of command
0	1	37H	No data request, command in progress
1	0	3BH	End of command
1	1	3FH	Data request, command in progress

The program to write a sector now becomes :-

```

LD DE,data address
LD C,FDC.data
LD H,high program address
;The next line must be at address xx33H
JR WREND
NDP
NDP
WRTST: IN A,(status)      ;address xx37H
LD L,A
JP (HL)
JR WREND      ;address xx3BH
NOP
NOP
EX DE,HL      ;address xx3FH
OUTI          ;write a byte to FDC
EX DE,HL
JP WRTST

WREND:

```

This program can be used for reading by changing OUT1 to IN1, either dynamically or by having another copy. Any length sector can be used as the loop only exits when the FDC says it has finished the operation.

One improvement would be to replace the switches to determine the state of the other six bits by a latch which could be written to by the program, allowing more flexibility in locating the program in memory.

In my system, the address decoding is set for 70H to 77H. Thus PORT' is active low for these addresses while LE' is active for 70H - 73H and CE' for 74H - 77H. LE' is used to read the status byte as above and to write to the latch to set the density and disk select. CE' selects the FDC chip so that the FDC status is at address 74H, the track register is 75H, the sector register is 76H and the data register is 77H.

The FDC has its own CE' input tied low permanently because of the timing relationship between CE', RE' and WE'. The generated CE' is combined with RD' and WR' to produce RE' and WE'.

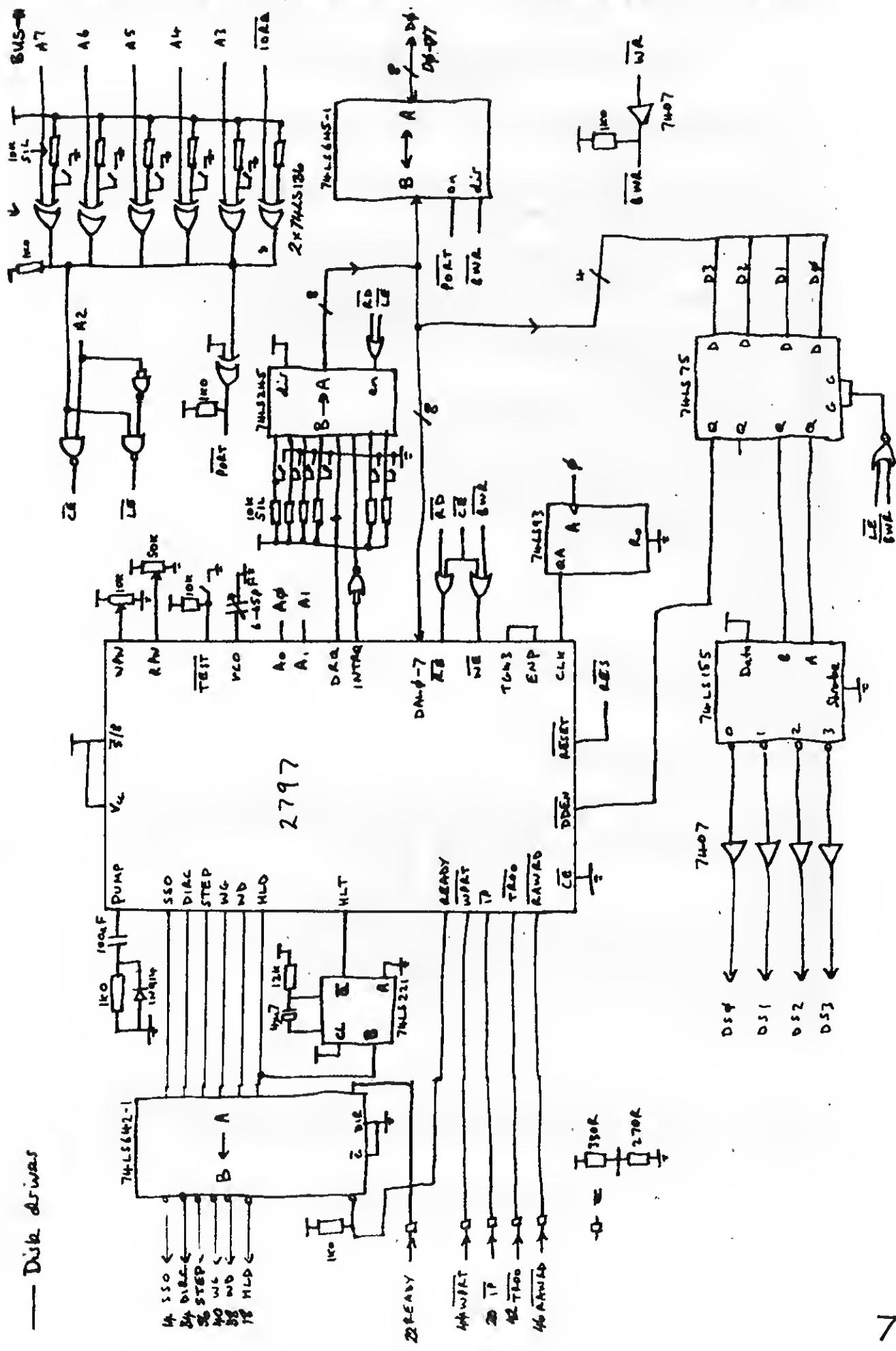
The disk is selected by the bottom two bits of the latch at address 70H-73H. Bit 3 is used to select the density: 0 is double density, 1 is single density.

I have not yet seen the circuit diagram for the XFDC-1 from Greenbank Electronics so I do not know how similar it is. As it uses the same chip, it should be easy to convert programs written for one to use with this circuit.

It is definately worth getting CP/M running as it gives much more freedom to develop and debug programs. It was not difficult to get it all working, the only problem being that an oscilloscope is needed to set up the 2797. But that's what friends are for!

(ED- Simons's circuit is overleaf)

## — Disk drivers



DRAWING LINES, CIRCLES AND POLYGONS WITH XTAL.  
BY BRUCE JOYCE

n.b Although this article uses the VOU-K2 the principles are the same for both 32 and 64 columns.

Before using the examples in this article, enter the line and circle drawing utility programs shown below :-

```

1999 REM ****
2000 REM * UTILITY TO DRAW STRAIGHT LINES FROM/TO SET COORDINATES *
2010 REM * REQUIRES VALUES FOR A ,B (START COORDINATES) AND *
2012 REM * A1,B1 (FINISH COORDINATES) *
2014 REM ****
2020 1F A=A1 THEN GOTO 2160
2030 C=(B1-B)/(A1-A)
2040 1F A<A1 THEN LET S=1: ELSE LET S=-1
2050 1F B<=B1 THEN LET C=ABS(C): ELSE LET C=ABS(C)*(-1)
2060 LET D=B
2070 1F A>A1 THEN LET A=A-1: ELSE LET A1=A1-1
2080 1F C<1 THEN LET S1=-1: ELSE LET S1=1
2090 FOR X=A TO A1 STEP S
2100 FOR X1=D TO D+C STEP S1
2110 SET X,X1
2120 NEXT X1
2130 D=D+C
2140 NEXT X
2150 GOTO 2200
2160 1F B>B1 THEN SWAP B,B1: FL=1
2170 FOR X=B TO B1
2180 SET A,X
2190 NEXT X
2200 1F FL=1 THEN SWAP B,B1: FL=0

29999 REM ****
30000 REM * UTILITY TO DRAW CIRCLES ANYWHERE, ANY SIZE ON SCREEN *
30005 REM * REQUIRES VALUES FOR AN (No. OF PLOTS) *
30006 REM * R (RAO1US) *
30007 REM * HC (HORIZONTAL CTR.) *
30008 REM * VC (VERTICAL CTR.) *
30009 REM ****
30010 FOR C=0 TO 360 STEP AN: REM SET ANGLE FOR PLOT
30020 A=C*((2*PI)/360): REM CONVERT TO RAO1ANS
30030 SET HC+(2*(COS(A)*R)),VC+(SIN(A)*R)
30040 NEXT C
-----
```

(EO. The above utilities are called by several of Bruce's programs in this article. What worries me is that there are no RETURN statements. Perhaps you can work it out, or Bruce will write and explain in time for the next issue.)

The main body of Bruce's article begins overleaf.

Many users of Interak are scientists, buisnessmen, sensible, good up standing pillars of society. As such the basic that is supplied by XTAL is just what they require. But for the rest of us, alien zapping, maze walking, adventure solving morons, who are sat infront of our vdu for hours on end, we could do with a bit of help with the graphics dept..

These utilities will help in this direction. But really it would be better if they could be implemented in m/c code and added to XTAL. Anyway, they can still be used to good effect.

The first draws a line from one pair of co-ordinates to a second pair. Try EX1:-

```
1 REM EX1
10 PRINT @0,0
20 INPUT"A=";A: INPUT"B=";B: INPUT"A1=";A1: INPUT"B1=";B1
30 GOSUB 2000
40 GOTO 10
```

This is alright but if you want to draw something then you would need to always give information for both ends of the line. In EX2 this is over come by asigning A and B the previous A1 and B1. Thus the end of the first line becomes the start of the next line.

```
1 REM EX2
10 INPUT"A=";A: INPUT"B=";B
20 PRINT @0,0;"A=";A: PRINT"B=";B
30 INPUT"A1=";A1: INPUT"B1=";B1
40 GOSUB 2000
50 A=A1: B=B1
60 GOTO 20
```

Is that not a barrel of laughs? NO! alright then:lets try some circles. Because true circles are not made from straight lines we need a differant form of co-ordinates. These are called 'Polar- ordinates' and position something in relation to a central axis and not our previous vert. and horz. axis. That something in our case is the cursor. Line 30030 creates the polar ordinates on an arc of R about then axis HC/VC. Now try EX3:-

```
1 REM EX3
10 HC=64: VC=23: R=20: AN=5
20 CLS
30 GOSUB 30000
40 R=R-4
50 IF R<1 THEN END
60 GOTO 30
```

AN sets the angle through which the cursor will move between each plot. Now try EX4. This will show you something to at least get you interested in experimenting with this utility.

```
1 REM EX4
10 HC=B2: VC=23: R=0: AN=3
```

```

20 CLS
30 R=R+3
40 IF R>21 THEN GOTO 100
50 GOSUB 30000
60 HC=HC-3
70 GOTO 30
100 R=R-3
110 IF R<3 THEN END
120 HC=HC-3
130 GOSUB 30000
140 GOTO 100

```

Now that looks quite nice does it not? Try some your self and see if you can get your printer to make you a hard copy. Makes a cheap card, although the program that I wrote for the print routine did take about six minutes.

Now for the clever bit. If you could use the polar ordinates and connected them with the co-ordinate type straight lines then you could draw polygons. WHOOPEE!!?. Not that exciting ah. Oh well I'll tell you about it any way.

First we set AN to the number of sides on the polygon that we want to draw. We also need to know where to start drawing the polygon as this determines the final position. For example it would not be of much use drawing a Star of David with both tri- angles the same way round. I will use this in EX5. Notice in this example that not only is the polygon drawn but you can super-impose any amount of other polygons on top. Now this card making looks more impressive.

```

1 REM EX5
10 PRINT@,0;"ENTER SIDES,STEPS,ANGLE TO START,RAD.,HORZ.CTR,VERT.CTR,"
20 INPUT CN,C1,R,HC,VC: REM*TO DRAW STAR SET SIDES TO 3 AND STEP TO 2
30 FOR Y=1 TO CR
40 T=0
50 C1=C1+(360/CR)
60 GOSUB 200
70 FOR Z=1 TO CN
80 A=A1(Z): B=B1(Z): A1=A1(1+Z): B1=B1(1+Z)
90 IF Z=CN THEN A1=A1(1): B1=B1(1): REM*THIS RETURNS TO ORG TO COMPLETE
100 GOSUB 2000: REM*DRAWS LINES TO POLAR-ORDINATES
110 NEXT Z
120 NEXT Y
130 GOTO 10
200 REM*PROCESS POLAR ORDINATES
210 FOR C=C1 TO 360+C1 STEP 360/CN
220 T=T+1
230 A=C*((2*PI)/360)
240 A1(T)=INT(HC+(2*(COS(A)*R))): B1(T)=INT(VC+(SIN(A)*R))
250 NEXT C: RETURN

```

Please feel free to use any of this in your programs and if any one has any other utilities, there is at least one user waiting to read about them in Interaktion.

SNOOPY  
BY R.ELDRIDGE  
For ZY8ASIC systems

```

1 PRON
100 P."          XXXX
110 P."          X   XX
120 P."          X   *** X
130 P."          X   ***** X      XXXXX  XX
140 P."          XXXX ***** XXXX    XXXX      XX
150 P."          XX   X ***** XXXXXXXXXX      XX  XXX
160 P."          XX   X **** X
170 P."          X   XX   XX   X
180 P."          X   //XXXXX   X
190 P."          X   //   X
200 P."          X   //   X      XXXXXXXXXXXXXXXX/
210 P."          X   XXX//   X   X
220 P."          X   X   X   X
230 P."          X   X   X   X
240 P."          X   X   X   X   X
250 P."          X   X   X   X   X
260 P."          X   XXX   X   X
270 P."          X   X
280 P."          X   X
290 P."          XX   XX
300 P."          XX   XXXX  XXXXXX/   X   XXXX
310 P."          XXX   XXX***   X   X
320 P."          XXXXXXXXXXXXXX *   *   X   X
330 P."          *---* X   X   X
340 P."          *-* *   XXX X   X
350 P."          *- *   XXX X
360 P."          *- * X   XXX
370 P."          *- * X   X   XXX
380 P."          *- * X   X
390 P."          *- *XX   X
400 P."          *   *X* X   X
410 P."          *   *X* * X   X
420 P."          *   * X** X   XXXX
430 P."          *   * X** XX   X
440 P."          *   ** X** X   XX
450 P."          *   ** X* XXX X
460 P."          *   ** XX   XXXX
470 P."          *   ** XXXX
480 P."          *   ** X
490 P."          ===== *   *   X   X   XXXXXXXX\
500 P."          #   #   /XXXXX   XXXXXXXX\
510 P."          ===== *   X
520 P."          ===== *   X
530 P."          ===== XXXXXXXXXXXXXXXXXXXX
532 P.P.P.
534 P."          SNOOPY
540 PROFF

```

VDU-2K MOD ALTERNATIVES  
BY STEVE PADLEY

My thanks to B.E. for a well laid out easy to follow article on the VDU-2K mod. I'm very pleased with the results and find the character size still comfortable without having to press my nose up against my 9" monitor. However I did not follow the alterations to the letter and managed to cut down the modification time to 3.5 hours. So for the benefit of other users who may be thinking of doing this mod here is a few alternatives to those described in the article by B.E.

If some users are like me, they don't like the idea of track cutting unless there is no option, here are a couple of alternatives to the original article.

Find instruction :-

- 1) Cut track U14 pin 3 - U22 pin 7  
Change to :-
- 1) Bend out U14 pin 3 so it does not enter socket.

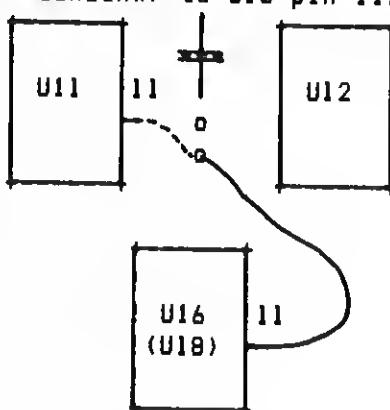
To avoid the hassle of removing the socket for U16 (U18 in my diagram) remove IC U16 and bend out pin 11 so it does not enter the socket. This means you can now neglect the following two instructions :-

- 2) Cut track U16 pin 11 - ground
- 2) Cut track U16 pin 9 - U16 pin 11

Now to make the link U16 pin 11 - U11 pin 11 solder a piece of fine gauge insulated wire (as supplied by Greenbank) to U16 pin 11.

Immediately above U16 and in between U11 & U12 is a capacitor and two through board holes.

These are of adequate diameter to allow the wire to pass. Ensure insulation is maintained at the point where the wire passes through the hole. The wire can now be soldered to U11 pin 11. Non-socket side.



This idea can also be employed to connect the two RAM's pin 9 to U8 pin 10 using the holes to the left of the RAM's, above C17.

Finally a hint for soldering the two RAM's together. If you possess an IC insertion tool with metal sided jaws they provide an ideal heat shunt and also hold the two RAM's in the correct position whilst soldering them, thus minimising the possibility of damage to the I.C's.

I hope you find these alternatives useful if you are considering this VDU upgrade.

'GAMES ONE  
BY PETE VELLA

For XTAL BASIC 64 with a 64 column 24 line screen

A set of three games:

Lunar Lander (Running out of fuel on moon)

Crazy Maze (Negotiate the maze - 30 representation)

Towers (Simulation of old game)

(ED "Crazy Maze" has already been published in IUGN-5 page 11, but is included so as to retain the compendium intact.)

```

100 CLS
107 FOR M=2 TO 15 STEP 5
110 FOR X= 1 TO 126
120 SET X,1+M:SET X,46-M
130 NEXT X
140 FOR Y= 2 TO 45
150 SET 1+M,Y:SET 126-M,Y
160 NEXT Y
165 NEXT M
170 PRINT@20 , 3;"** XTAL BASIC GAMES ONE **"
180 PRINT@20,9; "ENTER 1 FOR ROCKET LANDER"
185 PRINT@20,11; "ENTER 2 FOR CRAZY M A Z E"
187 PRINT@20,13; "ENTER 3 FOR TOWERS"
190 PRINT@20,15; "ENTER SELECTION NOW-->";
195 A$=INCH$
200 ON VAL (A$) GOSUB1000,1700,4000
300 GOTO 105
999 INPUT"";A
1000 CLS
1010 PRINTTAB(29)"ROCKET"
1020 PRINT:PRINT:PRINT
1030 PRINT"Lunar Landing Simulation"
1040 PRINT"----- ----- -----";PRINT
1050 INPUT "Do you want instructions (Yes or No) ";A$
1060 IF LEFT$(A$,1)="N" OR LEFT$(A$,1)="n" THEN GOTO 1280
1070 CLS
1080 PRINT"You are landing on the moon and have taken over manual"
1090 PRINT"control 500 Feet above a good landing spot. You have a"
1100 PRINT"downward velocity of 50 FT/SEC. 120 units of fuel remain."
1110 PRINT:PRINT"Here are the rules that govern your space vehicle:"
1120 PRINT
1130 PRINT"(1) After each second, the Height, Velocity, and remaining"
1140 PRINT" Fuel will be reported."
1150 PRINT"(2) After the report, A '?' will be typed. Enter the"
1160 PRINT" number of units of fuel you wish to burn during"
1170 PRINT" next second. Each unit of fuel will slow your decent"
1180 PRINT" by 1 FT/SEC."
1190 PRINT"(3) The maximum thrust of your engine is 30 FT/SEC/SEC or"
1200 PRINT" 30 units of fuel per second."
1210 PRINT"(4) When you contact the lunar surface, your descent engine"
1220 PRINT" will automatically cut off and you will be given a"
1230 PRINT" report of your landing SPEED and remaining FUEL."
1240 PRINT"(5) If you run out of fuel, the '?' will no longer appear,"
1250 PRINT" but your second-by-second report will continue until"
1260 PRINT" you contact the lunar surface.":PRINT
1270 INPUT "enter 'RETURN' to begin. ";RESP$
```

```

1280 CLS:PRINT"BEGINNING LANDING PROCEDURE....":PRINT
1290 PRINT" SEC FEET SPEED FUEL PLOT OF DISTANCE"
1300 PRINT" --- ---- ----- ----- -----
1310 PRINT
1320 T=0:H=500:V=50:F=120
1330 FMT2,1:PRINTT,:FMT3,1:PRINTTAB(5)H,:FMT2,I:PRINTTAB(5)V,:FMT3,1:PRINTTAB(5)F,: PRINTTAB(H/20+35) "*";
1340 INPUT B
1350 IF B=0 THEN GOTO 1480
1360 IF B>30 THEN B=30
1370 IF B>F THEN B=F
1380 V1=V-B+5
1390 F=F-B
1400 H=H-0.5 *(V+V1)
1410 IF H<=0THEN GOTO 1500
1420 T=T+1
1430 V=V1
1440 IF F>0 THEN GOTO 1330
1450 IF F=0 THEN GOTO 1470
1460 PRINT:PRINTCHR$(7):PRINT"**** Out of Fuel ****"
1470 PRINTT,:PRINTTAB(5)H,:PRINTTAB(11)V,:PRINT TAB(1B) F,:PRINTTAB(H/15+30) "*"
1480 B=0
1490 GOTO 1380
1500 PRINT:PRINT"**** Contact ****":PRINT
1510 H=H+0.5*(V+V1)
1520 IF B=5 THEN GOTO 1550
1530 D=(-V+SQR(V*V+H*(10-2*B)))/(5-B)
1540 GOTO 1560
1550 D=H/V
1560 V1=V+(5-B)*D
1570 PRINT"Touchdown at";T+D;"Seconds"
1580 PRINT"Landing Velocity=";V1;"FEET/SEC."
1590 PRINT"Units of Fuel remaining:";F
1600 IF V1<>0 THEN GOTO 1630
1610 PRINT:PRINT"***** CONGRATULATIONS! A PERFECT LANDING!*****"
1620 PRINT "***** YOUR LICENSE WILL BE RENEWED LATER *****"
1630 IF ABS(V1)<10 THEN GOTO 1660
1640 PRINT:PRINT" Sorry you blew it !!!!!"
1650 PRINT"Appropriate Condolences will be sent to your next of kin"
1660 PRINT:PRINT:PRINT
1670 INPUT "Another Mission ";B$
1680 IF LEFT$(B$,1)= "Y" OR LEFT$(B$,1)="y" THEN GOTO 1280
1690 PRINT:PRINT"CONTROL OUT."
1695 RETURN
1700 DIM M(9,9)
1710 PRINT :CLS:RESTORE
1720 FOR C= 1 TO 30:READ Z:NEXT C
1730 FOR Y = 0 TO 9 :FOR X=0 TO 9
1740 READ M(X,Y):NEXT X:NEXT Y
1750 PX= 0:PY = 0: B=1
1760 TX = PX: TY =PY
1770 CLS :RESTORE:FOR C= 1 TO 6
1780 READ LX,UX,LY,UY,D:MX = TX :MY = TY
1790 GOSUB 2550

```

```
1800 F =M(MX,MY):ON B GOTO 1810,1820,1830,1840
1810 Z=F AND B: GOTO 1850
1820 Z=F AND 1: GOTO 1850
1830 Z=F AND 2: GOTO 1850
1840 Z=F AND 4
1850 IF Z<>0 GOTO 1880
1860 GOSUB 2350
1870 GOTO 1890
1880 GOSUB 2440
1890 ON B GOTO 1900,1910,1920,1930
1900 Z=F AND 2:GOTO 1940
1910 Z=F AND 4:GOTO 1940
1920 Z=F AND 8 : GOTO 1940
1930 Z=F AND 1
1940 IF Z <> 0 GOTO 1970
1950 GOSUB 2410
1960 GOTO 1980
1970 GOSUB 2480
1980 ON B GOTO 1990,2000,2010,2020
1990 Z=F AND 1: GOTO 2030
2000 Z=F AND 2: GOTO 2030
2010 Z=F AND 4: GOTO 2030
2020 Z=F AND 8
2030 IF C = 1 THEN BF = Z
2040 IF Z <>0 GOTO 2120
2050 ON B GOTO 2060,2070,2080,2090
2060 TX=MX:TY=MY+1:GOTO 2100
2070 TX=MX+1: TY=MY: GOTO 2100
2080 TX=MX: TY=MY-1:GOTO 2100
2090 TX=MX-1:TY=MY
2100 NEXT C
2110 Z=1:GOTO2130
2120 GOSUB 2520
2130 REM
2140 IF PY<>9 OR PX<>9 GOTO 2170
2150 PRINT @4,15;"CONGRATULATIONS YOU MADE IT ";
2160 FOR C=1 TO 3000:NEXT C
2165 RETURN
2170 PRINT@4,1 ;"POSN ";PX;PY;" LOOKING ";
2180 ON B GOTO 2190,2200,2210,2220
2190 PRINT "NORTH";:GOTO 2230
2200 PRINT"EAST ";: GOTO 2230
2210 PRINT"SOUTH";: GOTO 2230
2220 PRINT"WEST ";
2230 INPUT " -DIRECTION ";A$
2240 IF A$="N" THEN B=1:GOTO 1760
2250 IF A$="E" THEN B=2:GOTO 1760
2260 IF A$="S" THEN B=3:GOTO 1760
2270 IF A$="W" THEN B=4:GOTO 1760
2280 IF A$="F" AND BF=0 GOTO2300
2290 GOTO 1760
2300 ON B GOTO 2310,2320,2330,2340
2310 PY=PY+1:GOTO 1760
2320 PX=PX+1:GOTO 1760
2330 PY=PY-1:GOTO 1760
```

```
2340 PX=PX-1:GOTO 1760
2350 FOR X = 1 TO 2*D-1
2360 SET LX-X,LY:SET LX~X,UY
2370 NEXT X:RETURN
2380 FOR X=1 TO 2*D-1
2390 SET UX+X,LY:SET UX+X,UY
2400 NEXT X: RETURN
2410 FOR X=1 TO 2*D-1
2420 SET UX+X,LY:SET UX+X,UY
2430 NEXT X: RETURN
2440 FOR Y=0 TO D-1
2450 SET LX-Y*2,LY-Y:SET LX-Y*2-1,LY-Y
2460 SET LX-Y*2,UY+Y:SET LX-Y*2-1,UY+Y
2470 NEXT Y:RETURN
2480 FOR Y = 0 TO D-1
2490 SET UX+Y*2,UY+Y:SET UX+Y*2+1,UY+Y
2500 SET UX+Y*2,LY-Y:SET UX+Y*2+1,LY-Y
2510 NEXT Y:RETURN
2520 FOR X=LX TO UX
2530 SET X,UY:SET X,LY
2540 NEXT X:RETURN
2550 FOR Y =LY TO UY
2560 SET LX,Y :SET UX,Y
2570 NEXT Y :RETURN
2580 DATA 6,85,2,40,3
2590 DATA 17,74,7,35,6
2600 DATA 25,66,11,31,4
2610 DATA 33,58,15,27,4
2620 DATA 39,52,18,24,3
2630 DATA 43,48,20,22,2
2640 DATA 12,5,4,7,12,4,5,5,5,6
2650 DATA 10,12,2,12,3,8,4,4,6,11
2660 DATA 8,2,8,1,4,2,10,10,9,6
2670 DATA 10,10,8,6,10,10,8,1,7,10
2680 DATA 9,3,10,10,8,2,9,6,12,3
2690 DATA 12,5,3,10,10,10,12,3,9,7
2700 DATA 10,12,4,3,8,1,2,12,5,7
2710 DATA 10,10,10,12,1,6,11,10,12,6
2720 DATA 10,10,9,2,12,2,12,2,10,10
2730 DATA 9,1,7,9,3,9,3,9,3,11
4000 REM
4010 CLS
4015 PRINT"The object is to move all of the disks from"
4016 PRINT"Post No.1 to post No.3. You may move the disks"
4017 PRINT"in any order you wish, but never more than one at a time.
You can also never place a large disk on top of a"
4019 PRINT"smaller one.":PRINT:PRINT
4020 INPUT "How many rings (1 TO 6) ";RINGS$
4030 RINGS=VAL(RINGS$)
4040 IF RINGS <1 OR RINGS >6 THEN GOTO 4010
4045 SC =0
4050 TW(0,0)=RINGS:TW(0,1)=0:TW(0,2)=0
4060 FOR A=RINGS TO 1 STEP -1
4070 TW(A,0) = RINGS-A+1
4080 NEXT A
```

```
4090 REM ZERO REST
4100 FOR A= 1 TO RINGS
4110 TW (A,1)=0
4120 TW (A,2)=0
4130 NEXT A
4140 GOSUB 4310
4150 REM
4160 INPUT "From which tower ";FT
4170 INPUT "To which tower ";TT
4175 SC = SC +1
4180 FT= FT-1:TT= TT-1
4190 IF TW(0,FT)=0 GOTO 4290
4200 IF TW(TW(0,FT),FT)>TW(TW(0,TT),TT) AND TW(TW(0,TT),TT)<> 0
THEN GOTO 4300
4210 TW(0,TT)=TW(0,TT)+1
4220 TW(TW(0,TT),TT)=TW(TW(0,FT),FT)
4230 TW(TW(0,FT),FT)=0
4240 TW(0,FT)=TW(0,FT)-1
4250 GOSUB 4310
4260 IF TW(0,2)=RINGS THEN GOTO 4580
4270 GOTO 4160
4280 END
4290 PRINT"No ring on post ";FT+1:GOTO 4160
4300 PRINT"You cant do that":GOTO 4160
4310 REM DRAW TOWERS
4320 CLS
4330 FOR HT= 10 TO RINGS*2+10+4
4340 SET 20,HT:SET 21,HT
4350 SET 64,HT:SET65,HT
4360 SET 108,HT:SET 109,HT
4370 NEXT HT
4380 FOR VT=1 TO 20
4390 SET 20+VT-10,10
4400 SET 64+VT-10,10
4410 SET 108+VT-10,10
4420 NEXT VT
4430 REM DRAW RINGS
4440 VS=0
4450 FOR T= 0 TO 2
4460 IF TW(0,T)= 0 THEN GOTO 4550
4470 VT=0
4480 FOR A= 1 TO TW (0,T)
4490 FOR HT= 20-TW(A,T)*3 TO 20+TW(A,T)*3
4500 SET HT+VS,12+VT
4510 SET HT+VS,13+VT
4520 NEXT HT
4530 VT=VT+2
4540 NEXT A
4550 VS=VS+44
4560 NEXT T
4570 RETURN
4580 PRINT@1,30;SC ;" MOVES TAKEN"
4585 INPUT"Well done. Do you want to go again ";A$
4590 IF A$="y" OR A$="Y" THEN GOTO 4010
4600 RETURN
```

## LETTERS

Please write with comments, ideas, complaints and suggestions. Name and address must be enclosed. Responsibility for views and comments expressed cannot be held by the editor as members letters are published with the minimum changes (deleted bad language etc). (Note; I type what I see, if you forget a word then it will be missing in the newsletter, also if you spell a word wrong then it's quite likely that I will punch it in wrong.)

---

Dear Ed,

Here is a quick letter just to inform you of the fact that another VDU-K is now happily running a 64 by 24 screen, also to submit an article on the VDU-2K mod, if you think it of value to other users.

STEVE PADLEY, 14 WICKHAM RD, FAREHAM, HANTS, PC16 7EU.

---

Dear Ed,

Once again Interaktion No 6 made interesting reading, I was suprised to see some of my own submissions in there! Shame it only ran to 20 pages and was short on software.

I will agree with you regarding screen size, that it should be 80 columns but I suspect this will mean a completely new VDU design, could take a little time?

Having taken a quick look at the Spacehunt prog I spotted just a little error in line 610 ie. ommit first quote mark " before 2.

I have now altered all my programs to 64 columns, some I sent to you last time are 32 cols like Spacehunt. Hope to enclose 64 col versions, some of which have also been modified in other ways to include more on screen detail and sound!

Talking of software I always have problems getting the stuff from Pete Vella. ie. early December order 'Rakovsky' chess prog sent reminder Jan 10, result nothing, second reminder Jan 30, third reminder Feb 19 and still at the minute nothing by way of a reply or a program! (27/3/85).

I know Pete is very busy, and I have offered help more than once, I would think many members are desperate for software of all kinds. This is perhaps where most of all Interaktion should help and support its members!

Many thanks for printing my letter also in No 6 however there's a word missing ie. "I have just done your 64 column mod quite right first time" should read "NDT QUITE RIGHT FIRST TIME" as I did have a few problems, all may I say of my own doing? (I'm only a small fella and my head is in the right proportion!)

I had this idea of doing the mods without any track cutting or socket ripping this was when I got introduced to wire-wrapping. Greenbank provided the tool for about a fiver, it's so simple, and neat, why I didn't use one before (for IDC connectors) I'll never know, I used patch pins where I could and even wire wrapped direct to IC pins.

Congratulations to Greenbank Electronics their now starting to stock things like Monitors and recorders, I took delivery of one of

those monitors some weeks ago, it's a Ferguson MM02 12" with green screen and a bandwidth of >25Mhz. At £65 plus £4 carriage plus VAT it's one of the best computer extras I ever purchased. I can now tell an 0 from an 8 etc, and vertical lines are all so straight. I've also got one of the new Interak ring binders for manuals very nice finnish! Soft brown cover with gold blocking..

I'm very keen to build an EPROM Programmer but my PSU will only supply +5v, is there anyone out there done a mod to obtain 25v from 5v? I would be very pleased to hear from you and if anyone can help interface 'Ultimate Speech Synthesiser' (E&CM Mar/Apr 84) to Interak HELP! I get a repeating sound not alot like speech! Also hope to add a real time clock using MM5B174 or MC6B18 anyone doing similar or interested care to make contact.

MEL SAUNDERS, 7 DRUMCLIFF RD, THURNBY LOOGUE, LEICESTER, LE5 2LH.  
-----

Dear Ed,

I wish Bob Eldridge had written his article on CP/M a year ago when I was trying to get my system going. I am glad to say that it is now up and running quite happily and it was well worth the effort.

I would just like to point out that there is an error in his Bios. In OOCOM, where data is read from or written to disk, he uses INI and OUTI to transfer the data which decrements the B register and which is holding the retry count. The POP BC at address 4BE7 should be moved to 4BF5 to correct this.

There are three different BOOT ROMS available, depending upon the configuration of VDU, keyboard and printer. The problem of different hardware is overcome in CP/M by putting all hardware dependant code in the user written BIOS. To maintain standardisation between non-CP/M non-disk based Interaks, would it be possible to use this same idea so that software written on one configuration will run on any other?

This would involve adding the system EPROM (probably ZYMON in most cases) at least five entry points: screen output, keyboard status poll, keyboard input, printer status poll and printer output. Another one that would be useful could return the size of the screen in rows and columns so that intelligent programs can adapt themselves dynamically. The screen output routine would have to be quite complicated and allow for at least cursor positioning so that interesting displays may be constructed.

Thus when a new screen driver card, eg 80 x 26, is added, there will be no need to modify all your programs, only reprogram the system EPROM. Likewise, if the address space is expanded above 64K, the screen can be moved to allow for contiguous RAM with no embarrassing hole in it.

It will be up to Greenbank Electronics to implement this change, if it proves favourable, as ZYMON will have to be rewritten, but Interaktion can lead the way by defining a standard to start from.

SIMON WALLER, 18 RICHMOND TERRACE, CLIFTON, BRISTOL, BS8 1AA.  
-----

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Simple Pascal ..... J. McGregor & A. Watt  
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Mostek 1982/1983 Microelectronic Data Book(mem/CPU/Per) .. Mostek  
Memory Data Book & Designers Guide 1980 ..... Mostek  
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Epson MX-80 Type II Operation Manual ..... Epson  
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Richard Bowyer

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NAME	DESCRIPTION	CODE	YOU ORDER FROM	COST
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AC10.XX	Computer Chess (6 levs) (Chess men EPROM VDU-2K)	MC	C USER GROUP	/ £ 3.00
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Hangman	Spelling game	ZB2	A USER GROUP	PP
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Pools Pick	Random Draw Selector	ZB2	A USER GROUP	PP
Count	Learn to count	ZB2	A USER GROUP	PP
Dice Pontoon	Simple Game	ZB2	A USER GROUP	PP

Key: MC = machine code.

YOU: A 32 x 24 VDU-K

ZB2 = ZYBASIC.

B 64 x 16 VDU-1K

XL = XTAL BASIC.

C 64 x 24 VDU-2K

PP = Postage &amp; Packing.

POA = Please enquire (Price on Application).

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